

PULMONARY AND OSSEOUS TUBERCULOSIS IN AN EGYPTIAN MUMMY*

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MORSE, Brothwell, and Ucko¹ reviewed the evidence for tuberculosis in ancient Egypt, considering sources from literature, art, and human remains. Skeletal and mummy material demonstrated gross evidence of the disease, but microscopic confirmation was lacking. A more recent report showed that tubercle bacilli can be detected in mummified material,² and the present report is of a fatal case of tuberculosis in a child of the dynastic period of Egyptian history, with microscopic confirmation.

MATERIALS AND METHODS

The specimen was collected by a University of Pennsylvania Museum expedition, directed by Dr. Lanny Bell, which has been studying a group of tombs at an Upper Egyptian site known by the name of the overlying Arabic town of Dra Abu el-Naga.³ This site, on the road to the Valley of the Kings, consists of a number of decorated tombs of officials of the XIXth and XXth dynasties, *ca.* 1314-1085 B.C.

Among the original occupants of the tombs were the three high priests of the chief god of the Egyptian empire, Amun of Karnak, during the reign of Ramses II (1304-1237 B.C.). While excavating the tomb of Nebwenenef, the first of Ramses' high priests, a large number of intrusive burials was found. Nebwenenef died about 1290 B.C., and the intrusive burials probably date from about 1000 B.C. to 400 A.D., the beginning of the Christian era in Upper Egypt.⁴ These mummies suffered many indignities through the millenia, particularly from tomb robbers. The 30 individuals examined had been broken into 7,358 fragments.

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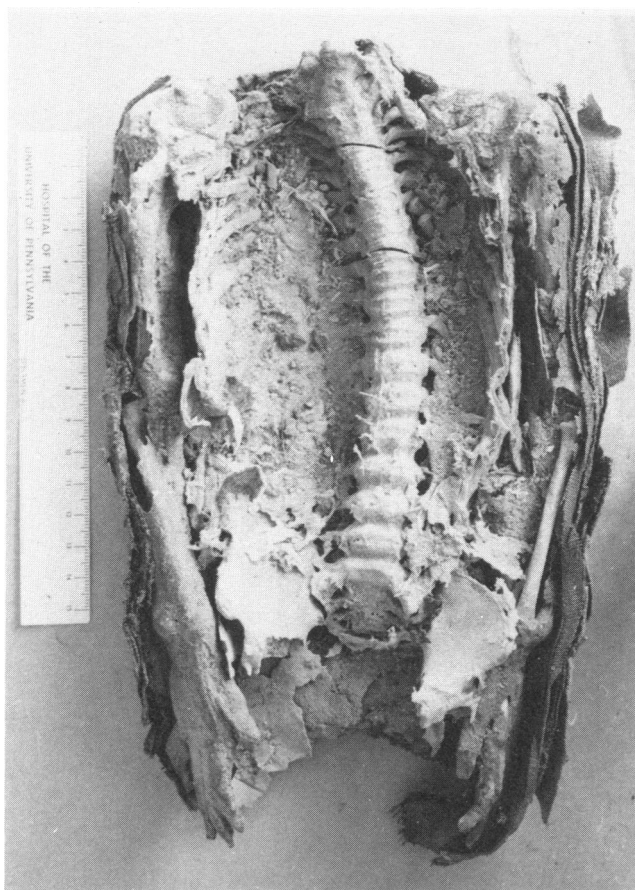


Fig. 1. The eviscerated cadaver shows marked scoliosis.

The most complete mummy in this collection was that of an approximately five-year-old child. The mummy's linen wrappings were removed and an autopsy was performed. Tissue specimens were rehydrated in Ruffer's solution,⁵ and sections were prepared and stained with hematoxylin and eosin, Masson's trichrome, Gomori iron, and Ziehl-Neelsen stains.

RESULTS

Unwrapping the mummy bundle revealed the trunk and arms of a child, approximately five years of age. The anterior wall of the thorax and abdomen was removed. The viscera were intact, although many desiccated



Fig. 2. Sections of the vertebral bone contain scattered acid-fast bacilli.
Ziehl-Neelsen stain. Original magnification: X1000

maggots were present in the abdominal cavity. In removing the organs, adhesions of the lungs to the chest wall were noted, and there was a marked scoliosis (Figure 1). The combination of the gross changes suggested a diagnosis of tuberculosis, rachitic scoliosis being unlikely in Egypt's sunny climate. Microscopic examination revealed tubercle bacilli in the vertebral bone (Figure 2), and fresh blood in the trachea (Figure 3) and lungs. Fibrotic areas of the lung showed a prominent deposition of iron pigment.

DISCUSSION

Anatomic findings suggest that this child suffered from osseous and pulmonary tuberculosis, with recurrent and finally fatal pulmonary hemorrhage. The histologic diagnosis of tuberculosis in the child's mummy completes the documentation of the presence of tuberculosis in dynastic Egypt.

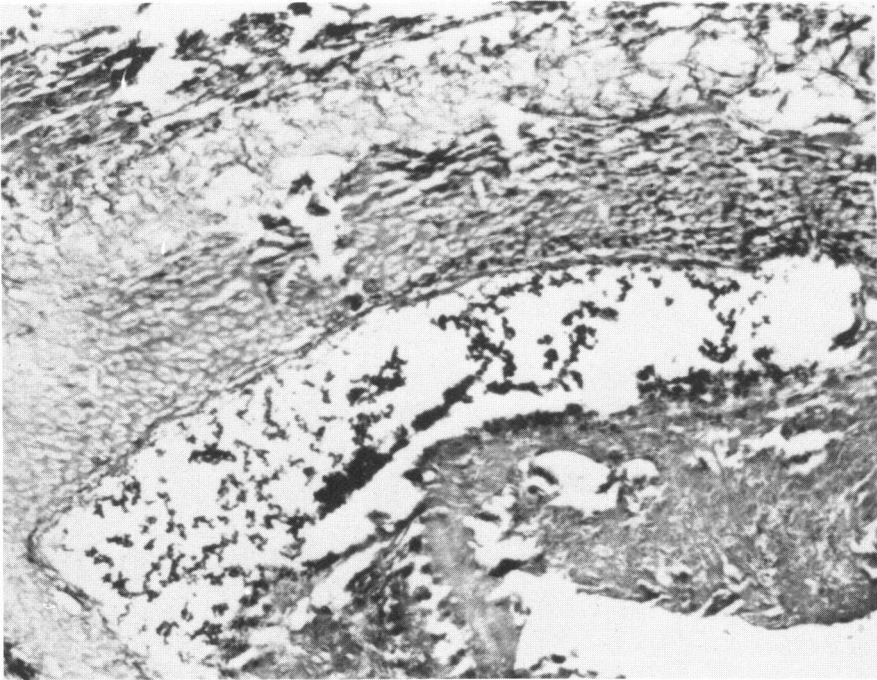


Fig. 3. The tracheal lumen, containing red blood cells, consistent with fresh and probably fatal hemorrhage. Masson's trichrome stain. Original magnification: X100

Tuberculosis is known to have been present in Egypt from early dynastic times, *ca.* 3000 B.C.¹ The absence of evidence of tuberculosis in predynastic material⁶ suggests that the human disease evolved at the beginning of the dynastic period. As cattle were domesticated at this time, a coeval evolution of *Mycobacterium tuberculosis* from *M. bovis* is an attractive speculation.

The inferences on social conditions and habitation patterns derived from the diagnosis of tuberculosis are of special value in view of the almost exclusively monumental emphasis in Egyptian archaeology. Of the few town sites excavated, only two, el Amarna, the briefly occupied city of Akhenaten,⁷ and Medinet Habu, the town associated with the mortuary temple of Ramses III,⁸ represent towns of the New Kingdom, the probable period of this child's brief life. These towns had multistoried, closely packed houses on narrow, winding streets. Major buildings were laid out in an orderly fashion, but subordinate structures were informally packed

into available vacant areas, with much rearrangement by individuals as well. Although claustrophilia has been termed the essence of successful community living,⁸ such crowding doubtless facilitated the transmission of tuberculosis in ancient Egypt, and absence of zoning based on social stratification insured that the wealthy were as liable to infection as the poor.

It is also of interest that the mummy reported here was that of a child. Infection probably came from intimate exposure to an elderly person with reactivated tuberculosis, assuming that the disease followed the same cycle in antiquity as in modern times. The finding of childhood tuberculosis is indirect evidence of multigenerational rather than bigenerational households in ancient Egypt, a pattern that persists today.

SUMMARY

A fully documented case of tuberculosis in the mummy of an Egyptian child is presented. The archaeologic significance of this diagnosis is considered, and we suggest that evolution of human from bovine tuberculosis occurred in the Nile Valley 5,000 years ago.

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